THE APRIL MEETING OF THE ILLINOIS SECTION.

The third annual meeting of the Illinois Section of the Mathematical Association of America was held at Rockford College, Rockford, Illinois, on April 28 and 29, 1922, in conjunction with the Illinois State Academy of Science. There were three sessions; on Friday afternoon Chairman Comstock presided, on Friday night at a joint meeting of the Academy and the Illinois Section President Knipp of the Academy presided, and at the Saturday morning session Professor Miller presided.

There were forty-two in attendance, including the following nineteen members of the Association:

C. E. Comstock, M. W. Coultrap, A. Emch, R. M. Ginnings, W. A. Hamilton, E. S. Haynes, J. M. Kinney, E. B. Lytle, W. D. MacMillan, L. E. Mensenkamp, Bessie I. Miller, E. J. Moulton, Mary W. Newson, C. I. Palmer, S. F. Parson, I. Roman, L. S. Shively, H. E. Slaught, and G. E. Wahlin.

The following officers were elected: G. T. SELLEW, chairman; C. E. COMSTOCK, vice-chairman; G. H. SCOTT, secretary-treasurer. It was suggested by unanimous vote that the next meeting of the Illinois Section be held again with the annual meeting of the Illinois State Academy of Science but the power to fix the time and place of the next meeting was given to the executive committee.

A committee consisting of E. J. MOULTON, chairman, C. E. COMSTOCK and E. B. LYTLE was appointed to report at the next meeting on the best courses in mathematics for college freshmen consistent with present standards of high school preparation.

The Illinois Section and the State Academy were entertained at a cafeteria dinner Thursday evening at the Rockford High School and at a banquet on Friday evening at Rockford College.

The following papers were presented:

(1) "Constructive methods in geometry" by Professor ARNOLD EMCH;

(2) "Some aspects of correlation theory" by Mr. L. E. MENSENKAMP;

(3) "Romance in science. An experimental course offered by a mathematics department" by Professor BESSIE I. MILLER;

(4) "Consistency in grading mathematics papers" by Professor E. J. MOULTON;

(5)[1] An illustrated address on "Cosmogony" by Professor W. D. MACMILLAN;

Discussion of the National Committee's Report on College Entrance Requirements.

(6) Professor G. E. WAHLIN;

(7) Professor S. F. PARSON;

(8) Dr. J. M. KINNEY;

Discussion of how many and what mathematics courses should be offered to college freshmen.

(9) Professor E. B. LYTLE;

[1] This paper was presented at the joint session on Friday evening.

(10) Professor R. M. GINNINGS;

(11) Professor M. W. COULTRAP.

Professor MacMillan's paper is to be published in *Scientia*, Milan, Italy. Abstracts follow of the first four papers and of numbers 8 and 10:

1. In his paper Professor Emch emphasized the importance of the constructive side of geometrical instruction in elementary as well as advanced courses. Most of the geometrical teaching, with a few commendable exceptions, is conspicuously deficient in this respect. This neglect of the constructive phase of geometry is, in most cases, not intended by the teacher; it is due to the fact that the teacher of the teacher was deficient himself on constructive methods. Professor Emch showed by some typical cases how the teaching of geometry can be made more effective and interesting. In solid analytic geometry the study of the hyperboloid of revolution of one sheet, for example, usually consists in the discussions of the plane sections parallel to the coördinate planes (including these). Very little attention is paid to the geometric organism of the surface. In the first place this surface may be generated kinematically, *i.e.*, by a generating line rotating about a fixed non-intersecting axis, relatively unchanged in its relation to the axis. From this generating principle the equation of the surface is easily obtained. Then the existence of another set of generators follows immediately. Finally a very effective graphical representation of the surface is obtained by means of an isometric projection. In this projection the principle of affinity is incidentally introduced. In this manner an exhaustive elementary study of a simple surface at once reveals a number of geometrical principles of fundamental importance. As another example, Professor Emch discussed the effective construction of an important class of plane sextics, a construction so simple that ordinary college mathematics is all that is required for its understanding.[1]

2. After briefly developing the theory of the measurement of correlation by means of the correlation coefficient and the correlation ratio, Mr. Mensenkamp proceeded to a discussion of the formulæ for the probable errors of these quantities. He dwelt at some length on the assumptions underlying their derivation and pointed out the consequent limitations to which they are subject. His paper will be published in full in a forthcoming issue of *The Mathematics Teacher*.

3. In Professor Miller's paper a new course was described as to its origin, organization, methods, and results. It is a two-hour semester course open to freshmen and aims to introduce them to scientific literature such as Poincaré's "Science and Hypothesis," Keyser's essays, etc., to such modern theories as the Einstein theory, and to some of the most recent mathematical developments and applications.

4. Professor Moulton reported on the consistency in grading mathematics papers shown in an experiment at Northwestern University two years ago. Fifty papers on a five-question test in the theory of exponents were graded independently and in their usual manner by eight members of the mathematics

[1] A great number of other examples of this sort might be produced which would add further strength to the contention that constructive methods in geometry are of great heuristic value, and that their importance should not be underestimated.

department. The average grade for the fifty papers by the eight men was 61.4 per cent.; six of the eight instructors had average grades within 2 per cent. of this, the mean deviation for all eight being 2.1 per cent. A detailed study of the grades indicates, insofar as these grades are typical of mathematics grades in general, that if a number of instructors grade a number of papers: (*a*) The mean deviation on grades below 60 per cent. is about twice as great as on grades above 80 per cent. (*b*) The mean deviation of grades on definitions is nearly twice as great as of grades on formal algebraic work. (*c*) For good or excellent papers the mean deviation of grades on a paper containing answers to five questions is about 3 per cent., and the probability is 5 to 1 that for such a paper a random grade lies within 6 per cent. of the average. If the paper contains answers to twenty-five instead of five questions (perhaps a semester grade), this 6 per cent. is reduced to 4 per cent. (*d*) Instructors have a tendency to grade habitually high (or low), and a personal equation can be found which reduces their grades to normalcy. While the experiment may not be conclusive concerning the consistency of a group of instructors, it is pretty conclusive in testing the consistency of each with himself.

8. Dr. Kinney developed the following points: Instruction in secondary mathematics in the United States is characterized by an extreme formalism. This condition probably arises from the fact that the college mathematics of earlier times has been shoved down into the high school. There has been some improvement, as viewed from the pedagogical standpoint, during the past hundred years in the presentation of the subject matter. In geometry originals have been introduced and in algebra the so-called verbal problems. However, many of the originals have little value and many of the verbal problems do not raise legitimate mathematical questions. The writer believes that a great improvement can be made in secondary mathematical instruction by following the recommendations of the National Committee in regard to college entrance requirements.

10. Professor Ginnings discussed the effects of the present crusade against high school mathematics and the lowering of college entrance requirements in this subject. Under present conditions in Illinois, freshmen students offering two semesters of high school algebra should take a five-hour course, including algebra, the first semester and a two- or three-hour course in trigonometry the second semester. If three semesters of high school algebra is offered, then algebra and trigonometry should be offered the first semester and analytic geometry the second. Mathematics organizations should endeavor (*a*) to settle and get into high schools the best mathematics as a preparation both for college and for life (the two aims are not inconsistent); (*b*) to get a high school certificating law making it necessary for teachers to have special and ample preparation to teach the subjects they are actually allowed to teach. Future mathematical history will probably refer to the period immediately ahead of us as the "Renaissance period of the basal forms of mathematics in America."

E. B. LYTLE, *Secretary-Treasurer.*